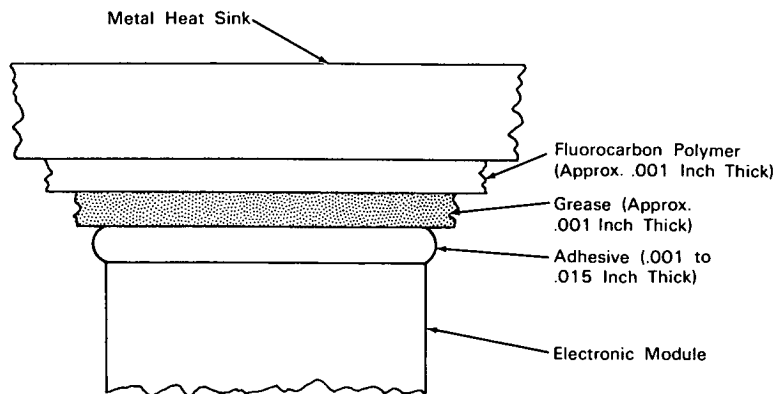


NASA TECH BRIEF



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Electronic Modules Easily Separated from Heat Sink



The problem: Bonding a metal heat sink and electronic modules to a thermal bridge which can be cleaved easily to facilitate removal of the modules needing replacement or repair. The bridge must consist of an interface of electrical insulating materials which offer little resistance to heat transfer from the modules to the heat sink.

The solution: A thin film of grease between a fluorocarbon polymer film on the metal heat sink and an adhesive film on the modules acts as a "cleavable plane", allowing easy separation of the fluorocarbon polymer-adhesive bond. The three-film interface provides an adherent, electrically resistive thermal bridge for heat-sinking of the modules at operating temperatures up to 100°C in a vacuum environment.

How it's done: The surface of the metal heat sink is spray-coated with the fluorocarbon polymer to a thickness of approximately 0.001 inch. A grease having a low vapor pressure and good thermal conductivity is applied to the polymer film and then wiped off to leave a thin residue. An adhesive (consisting of a mixture of polyamide and epoxy resins and 325-mesh silica) is then applied to the surfaces of the modules.

The assembly is completed by pressing the prepared surfaces together and allowing the adhesive to cure for approximately two hours at 65°C.

Notes:

1. The method described above can be used for replacement of modules that have been removed for repair.
2. A related innovation is described in NASA Tech Brief B63-10033, April 1964. Inquiries may also be directed to:

Technology Utilization Officer
Manned Spacecraft Center
P.O. Box 1537
Houston, Texas, 77001
Reference: B65-10186

Patent status: NASA encourages the immediate commercial use of this invention. It is owned by NASA and inquiries about obtaining royalty-free rights for its commercial use may be made to NASA, Code AGP, Washington, D.C., 20546.

Source: Westinghouse Electric Corporation
under contract to Manned Spacecraft Center
(MSC-142)

Categories No. 02 and 03